# Streptococcus Pneumoniae

Notes:

1. Penicillin is the preferred treatment for pneumococcal pneumonia (differs from that of legionellosis)
2. treatment is not preferred when the agent of a community-acquired pneumonia is unknown 🡪 use:
   1. either third generation cephalosporin (cefotaxime / ceftriaxone) plus a macrolide
   2. or a newer quinolone

Presentation:

1. 67 yr old man with abrupt onset of shaking chills, high fever, pain on right side of chest that began the prior evening
2. in last 24 hrs, had experienced SOB and cough🡪 rust colored sputum
3. patient is diabetic, smoked 2 pks of cigarettes a day
4. no vaccinations
5. PE: dullness to percussion over right upper thorax
6. CXR: consolidation of the right upper lobe
7. 24% band neutrophils in WBC differential
8. pneumococcal pneumonia

Streptococcus Pneumoniae

1. also known as pneumococci
2. gram positive lancet shaped diplococci (seen in LRT secretions)
3. see alpha hemolysis on BA medium
4. catalase negative
5. Optochin sensitive
6. thick polysaccharide outer layer
7. 23 serotypes cause 85-90% of pneumococcal infections in US

Epidemiology

1. most common during winter months in crowded conditions and after viral respiratory infections
2. it is the most common cause of community-acquired pneumonia afflicting all ages
3. transmitted person to person through aerosolized droplets
4. predisposing conditions for bad outcome: AIDS, asplenia, influenza, sickle cell, multiple myeloma, alcoholism, smoking, diabetes, hypogammaglobulinemia, nephrotic syndrome

Pathogenesis:

1. upper airway colonization🡪 aspirated into LRT🡪 normal host defenses fail to clear it🡪 bacterial proliferation🡪 inflammatory response causes pathology
2. Bacteria uses IgA protease to allow adherence to airway epithelium
3. Polysaccharide capsule- major virulence Ag, has antiphagocytic properties
4. cell wall glycopeptides cause recruitment of leukocytes into lung🡪 coagulation cascade and production of PAF (is an anchor for bacteria)
5. production of hemolysin🡪 pore formation, cytotoxic to celsl in lungs
6. pathology of lobar pneumonia has 4 stages:
   1. Congestion- serous exudation, vascular engorgement, rapid proliferation
   2. Red hepatization- liver-like appearance of consolidated lung, airspaces filled with PMNS, vascular congestion occurs, extravasation of RBC gives rusty sputum
   3. Gray hepatization- accumulation of fibrin associated with inflammatory WBC / RBC🡪 alveolar spaces are packed with inflammatory exudates
   4. Resolution- resorption of exudates
7. Pneumococcal pneumonia is classic airspace infection, with intra-alveolar exudates spreading rapidly within a lobe and through the pores of Kohn, until entire lobe is consolidated.
8. systemic inflammation🡪 release cytokines (TNF)🡪 chills, fever, myalgias, etc.

Treatment:

1. Penicillin- see up to 30% resistance
2. Prevention: immunization of high risk patients
   1. Polyvalent vaccine with capsular polysaccharides of 23 most common types
   2. For those 60 yrs +, and other at risk people
   3. Have pediatric vaccine for kids under 5